AN ANALYSIS OF
THE EFFECTIVENESS OF
ONLINE PEER FEEDBACK AT
THE UNITED STATES AIR FORCE ACADEMY

THESIS

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<div align="right">Annette M. Driscoll</div>

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<u>Abstract</u>

This thesis explores the effectiveness of the Air Force Academy's Department of English local area network peer feedback system. Four main questions were examined. These questions explored a) whether students reported improvement in their writing, b) whether students reported that feedback is worthwhile, c) whether students reported that LAN sessions increase enjoyment of writing, and d) what types of feedback the students 1) received and 2) found most helpful.

Three groups were studied. Forty-six students received feedback online, fifty students received feedback face-to-face, and thirty-three students did not receive feedback. Comparisons were made for the questions mentioned above to see if there was any difference in the responses based on the method of feedback the students received.

The results of the study suggest that students' perceived writing improvement is not affected by the peer feedback program. Peer feedback is successful in that students who participate find it to be worthwhile and at least one group believes that it makes writing more enjoyable. Finally, the two feedback groups reported receiving and wanting different types of feedback. The online group receives and prefers feedback on content, and the face-to-face group receives and prefers feedback on flow.

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I. Introduction

Chapter Overview

There are many different methods for teaching students to write well. One such method is currently in use at the United States Air Force Academy. The Academy's English Department has combined the use of available computer technology and the use of peer feedback to create a program using the Academy's Local Area Network to accomplish Online Peer Feedback. This thesis evaluates the effectiveness of the Local Area Network Online Peer Feedback program. The general research question is whether or not the online peer feedback sessions help the students become better writers.

Background

The United States Air Force Academy has, since its inception, required all freshmen students to enroll in English 111 (Freshman English). The purpose of this class is to acquaint the students with great literature, strengthen their writing skills, and enhance their analytical skills. As future leaders in the United States Air Force, these students must acquire the skill necessary in the writing-intensive environment of today's Air Force.

Until the 1995-1996 school year, a student's final grade in English 111 was based on three written papers of 8- to 10-pages in length. These papers were responses by the students to literature read as homework and discussed in class. In 1995, the Academy

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English Department decided to take advantage of the computer technology that was available to the students and staff. This technology includes a local area network (LAN) with a computer in each student's room and on each instructor's desk. An experimental curriculum incorporating online peer feedback sessions using the LAN was designed and implemented during the 1995-1996 academic year. Because faculty and students use the Local Area Network, these peer feedback sessions are referred to by the faculty as "LAN sessions." LAN sessions allow the students not only to write and edit using modern word processing technology, but also to critique each other's work and offer suggestions for improvement.

Research Questions

To evaluate the effectiveness of the online peer feedback curriculum, members of the United States Air Force Academy English Department asked for an answer to the principal question, "do the online peer feedback sessions improve the students' writing?" This thesis was designed around the following constraints: a) LAN feedback sessions require students to write considerably more than was written in the class in previous years, and b) no two instructors run the LAN sessions using the same procedures. Thus, this study was forced to rely on perceptual data about feedback effectiveness gathered from the students.

One of the main differences in how instructors implemented feedback in their classes was the type of feedback received. Each student fell into one of three groups. The first group received peer feedback online; the second group received peer feedback

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face-to-face; and the third group did not receive peer feedback at all. The research

questions to be answered are:

1. Will students who received peer feedback, either online or face-to-face, report

   more improvement in writing skills than students who did not participate in

   feedback?

2. Will students who participate in online peer feedback exhibit a stronger belief that

   LAN sessions make writing more enjoyable than students who participate in face-

   to-face feedback?

3. Will students who participate in peer feedback report that feedback is worthwhile?

Importance of this Research

      This information will be useful to the United States Air Force Academy English

Department, as it will help in decision making about the future use of the Online Peer

Feedback LAN sessions. If this research shows that the students believe peer feedback is

helping them become better writers and that they enjoy writing in the local area network

environment, a basis of support for the spread of this educational and motivational tool

will be established. This research may be used as guidance for making decisions about

requirements for classes other than basic English to increase the required writing as part

of their course work (also known as writing across the curriculum). This is especially

important when one takes into consideration that teachers of other subjects would have to

assign essays in addition to teaching their regular coursework. Peer Feedback may prove

to be a useful tool which enables instructors to accomplish everything they need to do

without adding significant additional work to their already heavy load.

Limitations

Only first year students at the Air Force Academy were studied. Results from this study should be generalized across other populations with extreme care. Students at the academy exist in an environment significantly different from the traditional college environment. These students are expected to maintain academic, dress, behavior, athletic, and leadership standards not found in the typical college environment. However, this research should provide a starting point for other researchers interested in online peer feedback and its perceived worth to students.

Thesis Overview

Chapter I has outlined the background for this thesis, summarized what research questions are to be answered, and discussed why this research is important. Chapter II explores the literature addressing both the use of peer editing as a tool for improving student's writing, and the use of computers in writing and peer editing. Chapter III discusses the methodology used in this study in depth and explains the methods used by the Academy English Department for its particular brand of Peer Feedback. Chapter IV shows the data and gives the results of each research question. Chapter V summarizes the results and provides suggestions for further research.

II. Literature Review

Introduction

To better understand the broad topic of peer feedback, the concept of writing as a process must be understood. Comprehension centers on the answers to six questions. These are: What is peer feedback? What are the positive arguments for using peer feedback? What are the concerns and drawbacks to using peer feedback? What can be done to alleviate these concerns and drawbacks? How is peer feedback implemented? And, how do computers fit into the picture? This literature review examines writing as a process, then it addresses each of these questions.

Writing as a Process

There is a consensus in the literature that writing as an academic exercise is no longer viewed as the creation of a product; rather, the emphasis is now on the process followed to create the written product. Nelson and Murphy (1993:135) state that there is a "shift in the teaching of composition from an emphasis on product to an emphasis on process." Writing as a process includes several steps, the fundamental building block of which is revision. Each paper should be revised many times, each revision making the ideas more clear and the writing more concise. For example, Marcoulides and Simkin (1991:80) say writing should be viewed as a process "that requires planning, execution, and revision." Similarly, Mangelsdorf (1992:274) describes an approach "in which writing is seen as a process of discovering and revising ideas." And finally, Healy and Jensen (1996:58) describe a writing process where "most writers benefit from writing

more than one draft, from getting feedback on their writing, and from having a chance to discuss their writing with interested readers."

The change from writing as the creation of a product to writing as a process can sometimes be difficult to achieve, but is worth it. Sultan (1988) tells of frustration in trying to change the writing habits of a group of students. They had viewed writing as the creation of a product and were ignoring content and placing the importance on neatness, perfect formation of letters, and perfect margins. Sultan wanted them to shift to a program of process writing where the emphasis is on content. The basic difficulty was in making the students understand that revision is a process that should be aimed at improving their communication of an idea rather than the idea that revision is a process of "recopying" to improve neatness. Hughes (1991:42) encourages her students to view writing "as a succession of small achievable steps."

What is Peer Feedback?

While it is not clearly stated in the literature, there seems to be a basic assumption that teaching writing as a process requires a different set of techniques than teaching writing with an emphasis on product. A different technique for "process writing" makes common sense. Process writing emphasizes what the writer is trying to say, or the content of the paper, rather than the technical aspects of writing such as spelling and punctuation. Sultan (1988), after successfully refocusing her students from a product emphasis to a process emphasis, saw 94 per cent of her students pass the Mississippi State Functional Literacy Exam, a statewide test with a direct writing sample. Statewide, students like hers averaged only a 54 percent pass rate. She claims that grammar drill,

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emphasis on basic skills using workbooks, and revision based on teacher evaluation of drafts are not responsible, as these techniques were not used in her classroom. Rather, her emphasis was on writing for content and participation "in peer response groups for content feedback" (Sultan, 1988:66). MacArthur (1994:25-26) says that the success of the process approach may result in part because the teacher "responds to what the student has to say before working on skill development." In MacArthur's classroom, peer evaluators are encouraged to focus on content and communication first, and not spelling and grammar errors. Katstra, Tollefson and Gilbert (1987:168) claim that emphasis on mechanics and spelling coupled with the students' knowledge that what they write will be corrected in the "traditional red ink" can lead to the replacement of enthusiasm for writing with worry over form.

One technique to improve writing using the process approach is to expose the students' writing to the criticism of their peers. This technique is being heard about more often, both in the classroom and in the literature. As early as 1972, Kenneth Bruffee published a textbook "that has served as the primary college textbook for teaching writing using collaborative learning" (Holt, 1992:386). Unfortunately, his technique was not embraced as widely as it might have been. It was not until almost two decades later, in the late 1980s, that peer feedback seemed to come into its own.

Lardner (1989) describes the use of peer response groups in the process approach to writing as the most promising. Although the term peer feedback is highly descriptive and is virtually self-explanatory, it is known by many different names in the literature: peer feedback (Elbow and Belanoff, 1995), peer response (Nelson, 1993, Holt, 1992), collaborative revision (Sultan, 1988), peer review (Hughes, 1991), peer evaluation

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(Liftig, 1990) and peer critique (Holt, 1992). Whatever the name, they all agree on one point; peer feedback is invaluable in helping students to write better.

Positive Arguments for Using Peer Feedback

A main goal of any English class is to improve the writing skills of the students in that class. Research indicates that peer feedback is an effective way to achieve this improvement (Healy and Jensen, 1996; Hughes, 1991; Elbow and Belanoff, 1995; Nelson, 1993; Sultan, 1988Liftig, 1990; Harp, 1988; Lardner, 1989; Davis, 1996; Tollefson and Gilbert, 1987). Lardner (1989) comments that participation in peer response results in stronger revisions than participation in student self-evaluation. This comment means that students make more changes and write better papers based on peer response. Research suggests that this improvement can be accomplished by the act of revising the current paper, or by internalizing the feedback and showing improvement in future writing (Sultan, 1988). Harp (1988) adds that there is evidence that reading comprehension can be improved because of peer editing.

Sultan (1988) observes that her students began discussing their papers with their peer groups even while they were still in the planning stage. Because the concept of peer review was introduced and encouraged, the students were comfortable with the peer feedback process. Students were then more apt to ask for help from their classmates on a casual basis, thus giving more thought and more time to each essay even before the first word was written. She also notes that there was improvement in their writing skills from paper to paper in spite of a reluctance to accomplish numerous drafts. This is interesting to note in light of the fact that she also states she "cannot support that more and better

revision of individual drafts occurred" (Sultan, 1988:66). Sultan suggests that there may be improvement in writing skills just by participating in the peer groups, regardless of the effort put into the actual writing.

Hughes (1991) observed improvement in her students' writing based not on peer feedback, but on their participation in a program that required them to actively tutor students from a lower grade level. This observation is related to Schramm and Rich's (1990:36) observation that students learn more from "participating in the learning experience than by watching it happen." Specific to peer review, Schramm and Rich (1990:36) observe that evaluating their peers helps students "better understand what is expected of themselves." Because students are actively participating, they have to pay closer attention to the material and thus are in a better position to understand and remember it.

Schramm and Rich (1990) also observe that receiving feedback from their peers gives the student information from several different points of view, rather than only one point of view, that of the instructor. The understanding of different points of view is important as it lets student authors recognize and write for different audiences (Mangelsdorf, 1992, Healy and Jensen, 1996, Nelson, 1993, Holt, 1992). Holt (1992:390) also suggests that feedback from different points of view may benefit the student later in life, as the review of written work by several different people from different backgrounds is "similar to the way professional writing may be scrutinized." Mangelsdorf (1992) comments that peer reviews make the audience real, giving the author the ability to see how that real audience will respond to what was written.

On the other hand, while Newkirk (1984) agrees that peer feedback leads to several different points of view, he identifies this recognition of different points of view as a problem. If the students are ultimately graded by an instructor, are being told that their papers should be written for a peer audience, and are receiving all interim feedback from a peer group, Newkirk (1984) questions whether or not the evaluation of the peer group will be consistent with the goals and evaluation of the instructor. He finds that students and instructors in his study use different criteria when evaluating student work. He suggests that the common practice of telling students to aim their papers at a peer audience should not be continued, especially when the ultimate grade will not be assigned by this same peer group. While this study does not support one of the popular reasons for using peer review as a classroom tool, it does agree with the use of peer feedback and gives a different reason:

> Students need practice applying the criteria that they are now learning.
> But rather than being viewed as the "natural" audience for fellow-students'
> writing, they might more profitably be viewed as apprentices, attempting
> to learn and apply criteria appropriate to an academic audience. (Newkirk,
> 1984:310)

One of the most practical reasons to use peer feedback is the time that it can save an instructor. When students critique each other's work, the instructor, in effect, deputizes the members of the class to do the instruction. In this way, an instructor can require more written work from the students without increasing the instructor's work load (Marcoulides and Simkin, 1991; Lynch and Golen, 1992; Healy and Jensen, 1996; Harp, 1988).

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Concerns and Drawbacks of Peer Feedback

There are several reasons why instructors are skeptical of the peer evaluation system. Several of these concerns are less a function of the process of peer feedback specifically, and more a function of introducing something new to the classroom. Some instructors are nervous about "turning over classroom time" to students (George, 1984:326). These instructors fear loss of "control" of the classroom (Liftig, 1990:62). Other instructors have tried peer feedback and had a negative experience, causing a reluctance to try it again (Holt, 1992:384).

Other concerns are specifically about students' ability to help each other through the use of feedback. Concern is voiced that peer feedback would "just reinforce the same errors they already make" and that peer feedback would result in a situation of "the blind leading the blind" (Sultan, 1988:65). There is also concern that students may not want to openly criticize their fellow students' writing (Lynch and Golen, 1992:48). Finally, there are questions about whether or not student reviews are consistent and effective and how likely they are to equal an instructor's evaluation of the same paper (Marcoulides and Simkin, 1991:81).

The attitude of the students is another concern. The research suggests that students will not use the feedback gained from their peers unless they think that this feedback is useful or valuable. George (1985) states that peer feedback will only improve performance if the class is convinced that it is worthwhile. Also according to George (1985:323), students are reluctant to use peer feedback if they are "suspicious of the value." Liftig (1990) reports that students have a tendency to ignore feedback they see as critical. He states that students do not incorporate this feedback into their revisions and

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are vocal in suggesting that these comments are not important. Liftig (1990) also reports that students who are involved in his successful program of peer feedback characterize peer feedback as useful in helping them build their writing skills.

Even among teachers who want to use peer feedback, there are concerns about the students' ability to perform adequately. There is some push to avoid peer feedback as, at best, a neutral experience and, at worst, a negative experience. Healy and Jensen (1996) caution that vaguely-worded approval and sentence level comment need to be avoided. Lardner (1989) mentions, as a concern, students' reluctance to give anything other than positive feedback, probably because they are afraid to hurt the author's feelings. Liftig (1990:62) supports the use of peer feedback but wants to avoid "the sporadic anonymous, and sometimes brutal commentary that had hurt feelings in previous classes."

Alleviating Concerns with Peer Feedback

There is consensus in the literature that peer feedback is helpful and valuable to the students (Sultan, 1988; Hughes 1991; Liftig, 1990; Holt, 1992; Marcoulides, 1991; Mangelsdorf, 1992; MacArthur, 1994; Katstra, 1987; Davis, 1996; Lardner, 1989; Harp, 1988), but there is no solution to the reluctance to add a new technique to the classroom. Reluctance to give up the "control" of the classroom is the personal preference of the instructor, and should not be used as a reason to avoid peer feedback.

The solution to the concern about students' ability to perform feedback, and their attitude toward it is more concrete. One solution is mentioned repeatedly in the literature: simply teach students what peer feedback is and how to do it. Instruction is recommended as a way to eliminate the vague positive-only comments and the brutal

feedback mentioned by Liftig (1990:62), as well as to ensure that student reviews are consistent and effective.

Lynch and Golen (1992) found that 56 percent of teachers surveyed do some sort of initial instruction with their students who were going to participate in peer feedback. Harp (1988) says preparation is essential. Mangelsdorf asks students for their feedback on the peer review process. According to the inputs she received, she concludes that "peer review sessions have to be carefully organized" (Mangelsdorf, 1992:281).

Elbow and Belanoff (1995) devote an entire chapter in their text to teaching students successful peer feedback techniques. This chapter is issued separately so that teachers who do not use their textbook will have access to it. Holt (1992) proposes a technique for preparing students for peer review that combines Elbow and Belanoff's techniques with Bruffee's cumulative peer-critique process, two techniques that she says complement each other well. According to Holt, Elbow and Belanoff's techniques fill the gaps in Bruffee's system.

Although there is agreement on the use of instruction to alleviate the concern about student ability and attitude, authors do not implement this solution the same way. The decision to teach students how to do peer feedback is an important first step in the peer feedback process.

Implementing Peer Feedback

The literature reveals myriad ways to conduct peer feedback. Many different variables can be assembled in a variety of combinations. These variables fall into three

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different categories: degree of instruction, procedural issues, and group issues. Each instructor has to decide what combination of these variables to employ.

Degree of Instruction. The one element that is agreed upon by almost every study is that students need some type of instruction in how to accomplish peer feedback before they can be expected to provide it effectively (Elbow, 1995; Harp, 1988; Lynch, 1992; Mangelsdorf, 1992; Healy,1996; MacArthur, 1994; Katstra, 1987; Lardner, 1989; Varone, 1996) . This instruction covers two categories. First, the instructor must teach the students how to do peer feedback. The students must learn the procedures the instructor expects them to use when they critique their fellow students' papers. Then, the instructor must teach the students how to interact during feedback. The students must learn the mechanics of interaction, giving positive feedback and constructive criticism as opposed to attacking the author.

While there is agreement that instruction in the peer feedback method is necessary, there are many different ways of accomplishing it. But there is one basic decision every instructor must make: how much time is to be devoted to each type of instruction. The decision on duration of instruction is dictated by the amount of information the instructor wishes to provide and the amount of time the instructor wishes to devote to each element to be taught. Depending on the focus, instruction can consist of a few minutes or an entire school year.

Every teacher also has to choose their own method for teaching these skills. Methods range from informal techniques such as simply reminding students to "balance positive and negative comments" and "look beyond the surface features of the paper"

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(Healy, 1996:59) to structured techniques such as modeling and student repetition (Mangelsdorf, 1992). Several authors outline complicated programs for teaching students how to accomplish peer feedback. Invariably, these authors spent more time overall on the instruction portion of the peer feedback experience.

In analyzing the peer review methods of 78 teachers, Lynch (1992) finds "preparatory interaction activities" fall into two main categories, large group and small group activities. The large group activities include such ice-breakers as students introducing themselves to the class and interviewing their classmates. The small group activities include such exercises as students going over class material, discussing case studies and actually critiquing student papers. As mentioned above, 56% of the teachers he surveyed employ these "preparatory interaction activities" (Lynch, 1992:46).

Elbow and Belanoff (1995:4) make instruction in peer feedback methods the subject of their pamphlet Sharing and Responding. They believe "students can give each other remarkably useful and productive feedback on their writing. But most of them need substantive help and instruction in learning to do so." Their pamphlet is a training instrument for use in teaching students how to provide successful peer feedback. As the authors state, "we have gathered together a full and detailed sequence of suggestions for students to use in sharing their writing with each other and giving and receiving useful responses" (Elbow and Belanoff, 1995:4). This program of feedback instruction begins with easy tasks such as simple sharing, where students simply practice the act of sharing their work with other students, then moves on to more and more complicated feedback techniques. This sequence includes such response techniques as "Summary and Sayback," where the student actively summarizes what is read without active criticism,

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"What is almost said?" and "What do you want to hear more about?" where the student

responds to ideas that are implied beyond the actual written words, and "Metaphorical

Descriptions," where the student describes the writing in terms of common everyday

objects, such as the weather or a piece of clothing, and responds to the writing in this

light.

MacArthur (1994:25) says "Some form of instruction in the cognitive processes

involved in revision, whether through direct instruction or teacher conferencing, appears

to be necessary." In his classroom, MacArthur involves his students in a formal student

editor strategy. This strategy has five steps. They are:

1. LISTEN and read along as the author reads
2. TELL what it was about and what you liked best
3. READ and make NOTES. CLEAR? Is anything hard to understand? DETAILS? Where could more details be added?
4. DISCUSS your suggestions with the author.
5. Author makes revisions on the computer. (MacArthur, 1994:26)

These five steps are taught to the students using a complex seven-stage process

that teaches the unskilled student in increments until the student is able to perform

successfully independently. The steps are:

1. Preskill Development - Does the student understand that writing is a process that involves planning, writing, revising and sharing his work?
2. Initial Conference - the teacher reviews current performance and discusses the importance of revision with the student.
3. Discussion of Strategy - the teacher describes the strategy to the student and explains why it is important, and when to use it.
4. Modeling of Strategy - The teacher goes through the process of editing a paper with the student watching
5. Mastery of Strategy - Students memorize the steps of the strategy
6. Collaborative Practice - Students practice the strategy of peer feedback in small groups with the support of the teacher.
7. Independent Performance - Teacher support becomes less and less often as the students learn to work in independent pairs. (MacArthur, 1994:26)

The main goal of this seven-stage process is to teach the students how, why, and when to use the student editor strategy. MacArthur believes that if the student understands these reasons, the student is more likely to use the strategy after the instruction period ends.

In the process of organizing her peer review process, Mangelsdorf (1992) heeds her students' complaint that peer review sessions need to be more organized to be successful. Her response to this is to teach students how to do peer review before asking them to do it for themselves. Mangelsdorf's (1992) technique is less formal than the technique discussed in Elbow and Belanoff (1995). First, she models the proper way to do peer feedback. Modeling is done by critiquing sample essays in class, then letting the students practice the proper way to "make suggestions for revision" (Mangelsdorf, 1992:281). Often students are allowed to see a peer feedback form completed by the teacher as an example.

Healy and Jensen (1996:59) use a relaxed form of instruction for teaching their review board members how to appropriately respond to their peer's writing. They simply "remind them to balance positive and negative comments," and "encourage them to look beyond surface features of a paper."

As with every other aspect of peer feedback, there are many different methods and techniques. However, the authors all agree on one point; students must be trained in the proper way to accomplish peer feedback if it is to be successful.

Procedural Issues. A large part of determining the amount and type of instruction that the students receive is the number and types of procedures that the instructor introduces. Several procedural issues should be addressed before instruction can begin.

The degree of formality indicates how structured the feedback experience is. Several elements combine to determine degree of formality. These elements are: feedback steps that must be followed; feedback form, including type of direction; type of communication to be used during the feedback effort; and the place of the feedback effort in the writing process.

Every instructor who practices peer feedback in the classroom introduces a set of rules or steps to the students. These steps determine the structure of the feedback sessions and vary in specificity. They range from having the student memorize an exact set of steps that must be followed each time feedback is conducted (MacArthur, 1994), to teaching students the different techniques that are available and allowing them to choose how and when to implement them (Elbow and Belanoff, 1995).

Another element that helps define degree of formality is the use of a peer feedback form. The use of a feedback form and, when a form is used, the type of form also vary widely from instructor to instructor. Several researchers use no formal peer feedback form (Nelson, 1993, Sultan, 1988, Hughes, 1991, Kowalski, 1989). Mangelsdorf (1992) recalls practicing a form of feedback where students read each other's work in a group setting and then verbally make suggestions for revision. Despite these researchers, use of a formal peer feedback form appears extensively in the research. The procurement and content of the forms, as well as the types of answers expected on the forms, differ according to instructor preference.

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Lynch (1992) observes that 42.1% of teachers surveyed who participated in peer feedback used a rating instrument. He further shows that of this group, 79.5% develop their own instrument, 10.3% take the rating instrument from a published source, and 10.3% use a rating instrument that was developed by the students and teacher together. None of the teachers surveyed use a rating instrument developed by students alone.

The most rigid of the peer feedback forms employs rating or ranking scales, effectively limiting the critiquing student to the topics and responses the instructor provides. In his study, Newkirk (1984) uses a feedback form that asks participants to both rate and rank the four papers they are responsible for critiquing. The participants first rate each individual paper on a scale of 1 to 10, with 10 high and 0 low; then they rank the papers relative to each other on a scale of 1 to 4, with 1 high and 4 low. Participants were not asked to answer open-ended questions about the content of the writing, but they were asked to write a paragraph explaining the reason for the rankings they assigned to each paper.

Still rigid, but more comprehensive, are the feedback forms that use a series of topics to be addressed, and likert scales for the reviewing student to rate the papers on those topics. Marcoulides (1991) makes use of a detailed Student Paper Evaluation Form that has the peer evaluator rate each paper in ten specific areas in three categories on a three item likert scale, good/fair/poor. Figure 1 lists these three categories and the areas under them. While this feedback form focuses on the use of closed questions, it also provides a section that asks for comments without providing a directive question.

Figure 1. Marcoulides (1991) Evaluation Form Categories

Subject Matter	Appropriateness to Course
	Properly Narrowed Focus
Content	Organization
	Flow Of Arguments
	Depth of Coverage
	Technical Accuracy
Mechanics	General Neatness
	Spelling and Punctuation
	Grammar
	References

A less rigid feedback form makes use of both open-ended questions and questions that rely on scalar answers. Mangelsdorf (1992) suggests that instructors develop this type of worksheet for use at more advanced levels. The worksheet developed by Mangelsdorf (1992) consists of specific questions requiring scalar answers about the content, focus, organization and development of the writing. It then asks open-ended questions that require the student to suggest ways the author could make the essay better in those areas. Mangelsdorf (1992) comments that these same questions should not be used for every feedback session; rather questions should be developed to coincide with the instructor's focus at the time the feedback form will be used.

Another type of feedback form does not use scalar answers. It allows the reviewer to answer specific open-ended questions. Healy and Jensen (1996) created a feedback form that focuses on having the reviewer make observations and ask questions about the content of the writing as opposed to merely correcting the writing. Their intention is twofold. First, they want to give the student performing the feedback some direction without leading the student to a particular answer, and second, they want to discourage the vague feedback students often give to each other (e.g., "I really liked your paper").

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One type of feedback form which employs open-ended questions is designed to allow the student doing the critiquing to answer broad questions in his own words. Liftig (1990:62) makes use of a four question peer-reaction worksheet that asks four specific questions about the memorable words, phrases, and events in the reading and is designed to provoke thought about the actual content of the writing being critiqued. The questions are:

1. What are the first three words that come to your mind after reading this story?
2. What is one memorable phrase from the story? Why do you think it sticks in your mind?
3. Recall briefly a memorable scene from the story. For what positive reasons do you think you remembered it?
4. What would be one element of this story that you, as reader, would like to read more about? (e.g., "I would like to read more about the main character's childhood.") (Liftig, 1990:62)

The decision about the type of feedback form to be used does not stand alone. The type of communication to be used during the feedback effort also needs to be selected. Responses can be either verbal or written (Hughes, 1991;Sultan, 1988; Lynch, 1992), and the type of communication can be affected by the use of a feedback form. The feedback form limits verbal communication because it ensures that at least part of the response will be written. Commonly, a combination of verbal and written feedback is used (Mangelsdorf, 1992). This is a good solution to the concern that verbal response alone is not as effective as written response because students have a tendency to block negative criticism and forget what is said (George, 1985).

Another procedural issue that needs to be addressed is the timing of the feedback effort. This is important because it helps to determine the overall formality of the feedback experience. The literature shows that the less structured the feedback effort, the

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more likely this effort is to occur spontaneously. In classrooms where the feedback effort is used more as a "lifestyle" and less as a task to be accomplished, the students become more comfortable with feedback as a whole and participate in it often and on an informal basis (Sultan, 1988; Kowalski, 1989).

Last, three final procedures need to be addressed. These procedures are anonymity, requirement for participation, and duration of the exercise. The research does not address the affect of anonymous vs. non-anonymous feedback; however, both MacArthur (1994) and Liftig (1990) require their students to put their name on the feedback they accomplish so the author knows who completed the critique. In contrast, Marcoulides (1991) takes steps to preserve anonymity when his students participate in their feedback sessions. The decision to conduct feedback in anonymity is to a certain degree controlled by the communication method chosen. Obviously, anonymity can be maintained only in a situation where the feedback is given and received in written form.

The next procedure that needs to be considered is who will be required to participate. There are several ways to do this, from requiring participation of the entire class, whether as a whole group or broken down into smaller groups (Marcoulides, 1991; Schramm, 1990; Mangelsdorf, 1992; Sultan, 1988; Hughes, 1991), to recruiting volunteers, both for providing writing that needs to be reviewed and for reviewing the work (Healy, 1996; Newkirk, 1984).

The final procedure that needs to be considered is the duration of the exercise (Lynch, 1992). One group of researchers conducts peer feedback as a one-time event (Newkirk, 1984; Marcoulides, 1995; Schramm, 1990; Liftig, 1990). Students are taught how to do feedback, perform feedback for one paper, and are not required to accomplish

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it again. Other authors conduct peer feedback on a continual basis, usually for the duration of the school year (Sultan, 1988; Nelson, 1993; Kowalski, 1989).

Group Issues. Group issues cover another set of variables that also vary from instructor to instructor. In some cases the group issues limit the procedures that can be used. These issues are size of group and composition of group,

Size of Group. The first group decision the instructor has to make is how many students to put into each group. Essentially, the instructor needs to decide whether students are going to do peer feedback on a one-on-one basis, in small groups, or in large groups. One-on-one feedback obviously limits the size of the group to two individuals. However, if the decision is to divide the class into groups of more than two, the instructor next needs to determine how many students to place in each group.

Lynch (1992) determines in his study that 13.4 percent of respondents implement peer evaluation groups with two students, 23.2 percent of respondents include the entire class, and 64.2 percent of respondents have peer evaluation groups of some size in between. Most of these respondents' peer evaluation groups consist of between three and five members.

Composition of Group. The physical composition of the group is another issue to be addressed. This issue consists of two factors, first, how students are assigned to each group, and second, whether the group is static or changing. While most researchers group their students randomly or do not address this issue at all, Mangelsdorf (1992) prefers to group her students by ability. She notes that when there is a wide

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variability between students' ability in a feedback group, the better students tend to give good feedback to the weaker students and receive little or no feedback in return.

If the feedback exercise consists of more than one feedback experience, or more than one paper is to be evaluated, the instructor should decide whether to use static groups or to require the students to change groups between exercises. There are arguments for and against static versus changing groups. Sultan (1988) keeps her students in static feedback groups for the duration of the school year. Not only are these students assigned to the same feedback group, they are seated at the same table for every writing class for the whole year. She prefers this static group because she notices a high comfort level based on familiarity with other team members. Even when the students are not engaged in formal feedback, they ask the other students on their feedback team for assistance with their papers throughout the entire writing process.

Other authors have their students change groups for every exercise so that every student benefits from as many different points of view as possible (Schramm and Rich, 1990; Mangelsdorf, 1992). This factor is especially important when a teacher institutes a program of one-on-one peer feedback. In the case of one-on-one peer feedback, the students do not have the benefit of several different points of view within their own peer feedback group, so pairing each student with several different partners provides different points of view.

Nelson (1993) explores the effectiveness of verbal communication during group feedback sessions in depth. She observes student groups participating in verbal feedback over a period of ten weeks. She finds that the effectiveness of the verbal interaction has to do with the type of interaction that occurs. She identifies two scales on which the

feedback experience can be measured. In her study Nelson (1993) finds that the students are either interactive or non-interactive and either cooperative or defensive. Students verbally respond to suggestions made by a peer (interactive), or do not (non-interactive). If they do respond, their response is cooperative (they are making an effort to understand what their team members are telling them) or defensive (the writer displays behaviors such as disagreeing or justifying). She finds that students are more likely to gain from peer feedback groups if they interact with the other members of the group in a cooperative way.

Computers and Peer Feedback

As previously stated, much of the literature suggests that peer feedback is successful in helping students improve their writing. Considering the progress in technology in the last ten years, the next logical step is to use computers in the implementation of peer feedback. This section looks at the use of computers during the writing process. It addresses the advantages of using computers during the writing process and peer feedback, and discusses the disadvantages to computer use during these processes.

Computer Use In Peer Feedback. Students have been shown to like writing with computers better than writing with paper and pencil (Kowalski, 1990). Because of this, it is thought that peer editing might be more effective if computers are used (Kowalski, 1990). These two thoughts lead to the next logical step: use of computers not only during the writing process, but also during the feedback process. However, one must heed

MacArthur's (1994) caution that although the computer is a helpful tool in the feedback process, it should not be used as a substitute for instruction in revision.

There are several suggestions for how to incorporate computers into the writing and peer feedback processes. Healy (1996) suggests the use of e-mail to supplement the work of his editorial board. While this suggestion is using computers to facilitate peer feedback, Healy (1996) does not seem to be suggesting that the use of computers makes the feedback process more effective. He is simply suggesting the use of computers to make the administrative tasks associated with the editorial board easier. MacArthur (1994) suggests the use of computers in all stages of the writing process. He reports the use of computers as especially useful during the revision process (MacArthur, 1994).

Kowalski (1990) outlines several different ways to use computers during the feedback process. She first discusses on disk editing, where the students write their paper on the computer and save it to a disk. The peer editor then accomplishes feedback by inserting his comments right into the text on the disk. Kowalski (1990) then mentions a colleague who uses computers for peer feedback. This colleague has his students bring a printed copy of their work to class, and the peer evaluators use the computer to fill out a peer feedback form.

These authors agree that computers can be advantageous when used during the writing process; however, they can also present difficulties. The next two sections address these advantages and disadvantages.

Advantages of Computer Use. The literature outlines several advantages of computer use over the standard pencil and paper way of writing and giving feedback.

MacArthur (1994) is not alone in his praise of the use of the computer to "ease the process of revision." Kowalski (1990) also mentions the relative ease of revision when it is done on the computer screen. These comments focus on the elimination of the mess involved in making comments and changes on paper with a pencil. MacArthur (1994) also comments on the use of computers to speed up the writing process, especially for students who have trouble with the physical act of writing with a pencil (MacArthur, 1994). Another practical advantage of using computers to accomplish peer feedback is the elimination of paper copies. Students no longer have to generate several copies of their paper; one electronic copy is sufficient (Kowalski, 1990).

Disadvantages of Computer Use. In Kowalski's (1990:38) classroom these positive aspects are overshadowed by the negative aspects discovered by her students. Kowalski (1990:38) reports that her students were "quite vocal about expressing their dissatisfaction" regarding the following point: there was concern that the computer was being used for peer editing because it was there, and not because that was the best way to accomplish the task. More importantly, her students complained that they had trouble reading entries of any length on the computer screen.

Other problems that impact the use of the computer for peer editing are physical problems. These problems include slow equipment, time consumed with booting up the system, and time spent trading disks (Kowalski, 1990). Time spent finding a system for the student to use outside of class time was also a concern (Kowalski, 1989).

Kowalski's (1990) final conclusion was that peer editing using the computer was not the positive experience she had hoped it would be. She states that her students started

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the school year motivated to write and edit on disk. However, the problems encountered using the computer for feedback soon negatively impacted their motivation.

Chapter Summary

In this chapter writing as a process has been discussed and the concept of peer feedback and ways to implement it have been introduced. The reader should also understand the drawbacks and concerns of using peer feedback in the classroom and the use of computers in the peer feedback process. The stage has been set to discuss the particular feedback methods examined in this study. Chapter III introduces implementation of peer feedback in the English Department at the United States Air Force Academy, the collection of the data for this study, and the method used to analyze the data and answer the research questions.

III. Methodology

Introduction

This chapter presents the information required to understand this research endeavor. It outlines the background information that shapes the study. This information includes a) the original LAN session procedures instituted in the Academy English Department, b) the procedures instituted for online peer feedback, c) the procedures instituted for face-to-face feedback, and d) the procedures followed for students who receive no feedback. Next, this chapter discusses the steps followed to collect the data, including a discussion of the questionnaire used, and the method of collection. Finally, this chapter discusses the methods used to analyze the data collected.

Background

To design this study, the researcher first examined how the Academy English Department conducts peer feedback. At the beginning of the 1995-1996 school year, the English Department implemented an online peer feedback program using the available technology. This available technology consists of a computer on each teacher's desk and in each student's dormitory room. These computers are hooked into the Academy's LAN. The sessions in this program are commonly called "LAN sessions" by the students and faculty.

Instructors were encouraged, but not required, to participate in this program as it is written. As a result, some instructors used the program in its entirety, some instructors used the program with minor changes, and some instructors used only parts of the original LAN session procedures.

<u>LAN Session Procedures</u>. The peer feedback program is intended to be integrated into the normal semester-long Freshman English class (English 111). This means that writing sessions and peer feedback sessions are accomplished during assigned class time. This is in addition to the usual activities of reading assigned essays for homework and discussing the essays in class. Peer feedback sessions are intended mainly to help the students become better writers, not as an exercise on which to base the final grade. Only ten percent of the course grade is based on the student's "LAN idea sessions" folder. This folder contains the results of all LAN sessions for the semester. The remaining ninety percent of the course grade is based on class participation and three papers the students are required to write independently of the LAN sessions.

The English Department's first step in instituting a program of peer feedback is to teach the students how to provide feedback that is helpful (versus harmful or neutral) to each other. This is done during the first two weeks of the semester using Elbow and Belanoff's (1995) text, <u>Sharing and Responding</u>. Students are required to read the text and to be prepared to discuss the techniques covered during class. This feedback training introduces the idea of peer feedback to the students, teaches them the techniques to use when accomplishing peer feedback, and makes them comfortable with the process of peer feedback. The main goal is to ensure that the feedback experience is positive for everyone involved.

After this material is discussed in class and the instructor feels confident that the students understand the concepts well enough to participate positively in peer feedback, the LAN sessions begin. Although LAN sessions are accomplished during regularly scheduled class time, unlike regularly scheduled classes where the students report to the

classroom, students do not report to the class, but instead participate in LAN sessions from their dormitory rooms. Each student's room contains a computer that is hooked up to the Local Area Network. LAN sessions are dependent on this equipment. Each LAN session is divided into two parts, part *A* and part *B*. These parts are accomplished during two consecutive class periods.

In part *A*, the students use the computers in their room during the regularly scheduled class time. First, they check their electronic mail (e-mail) for a message from the instructor. This message contains the direction the students need to write the essay for that particular LAN session. The direction is in the form of questions about the assigned reading that are to be answered in the essay. Students are given the entire 50 minute class period to complete their essay online. If, at any time, a student has a question about the assignment, the instructor is online and will receive and respond to e-mail messages from the student. Once the essays are complete, the students post them to the appropriate class folder on the common drive so that they may be accessed by the instructor and other students in their class.

Part *B* is accomplished during the next class period. In this part, the students access the essay of the student assigned to them. This essay was posted on the common drive the previous class period. The students critique the essays online, and post them, with comments, on the common drive. These critiques can be either in the form of comments inserted into the text of the essay, comments typed at the end of the essay, or comments posted as annotations to the text. After part *B* of the LAN session, students are responsible for reviewing the feedback they receive on their essay. The decision to revise the essay based on the peer feedback comments received is left up to the individual

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student; however, guidance from the course outline is as follows: "To be considered for an above-average grade, your final folder must include all five LAN sessions and either one major revision or two minor revisions."

Although this standard online peer feedback procedure exists, not all instructors follow this procedure. As a result, three different populations of students exist; students who participate in parts *A* and *B* of the LAN sessions and receive peer feedback online, students who participate in part *A* of the LAN sessions and, instead of participating in part *B*, receive peer feedback face-to-face during class time, and students who participate in part *A* of the LAN sessions and do not receive peer feedback.

Online Feedback Procedures. Two instructors implement online peer feedback in their classrooms exactly as outlined above. However, assignment of feedback partners is accomplished differently for each instructor. One instructor randomly assigns two or three students to each essay, so each author receives comments online from two or three classmates. This instructor does not assign the same feedback partners to each individual from LAN session to LAN session. The intent is for each student in the class to critique the writing of each other student in the class at least once.

The other instructor assigns students in pairs; each student critiques one paper and each author receives feedback from the same student whose paper he critiques. The instructor assigns these partners based on similarities. He assigns students to provide feedback to other students who have written essays on the same topic or who have made similar mistakes in their writing. For the purpose of this study, the 46 students of these two instructors form the "online feedback" group.

Face-to-face Feedback Procedures. Two instructors' students participate in face-to-face feedback. These students participate in part *A* of the online peer feedback sessions and do not participate in part *B*. Instead, these students are required to report to the classroom with a hard copy of the essay they wrote during part *A* for face-to-face peer feedback.

Once the students report to the classroom, they are given a single feedback partner. Sometimes the students are assigned a partner randomly, sometimes the students are assigned partners by the instructor based on skill level, and sometimes the students are allowed to select their own feedback partner. Students then exchange copies of the essays they had written during part *A* of the LAN session and are given twenty to thirty minutes to make comments directly on the hard copy of their partner's essay. After the allotted time has elapsed, students give the essay with their comments back to their partner and verbally explain the comments they had made on the paper. These 50 students form the "face-to-face feedback" group.

No Feedback Procedures. One instructor does not have his students participate in peer feedback at all. For part *A* of the LAN sessions these students report to their dormitory rooms and write essays in answer to questions about the reading. For part *B* of the LAN sessions, this instructor has his students report to the classroom. There, as a class, they discuss the questions asked in the e-mail. These 33 students form the "no feedback" group.

Research Questions

The overarching question is: "Is the online peer feedback program effective?" To answer this question, three research questions need to be examined. The research questions and the hypotheses tested to answer them are as follows:

Research Question 1: Will students who received peer feedback, either online or face-to-face, report more improvement in writing skills than students who did not participate in feedback?

> **Hypothesis 1a:** *Students in all three groups will report a significant change in their writing skills between the beginning of the semester and the end of the semester.*
>
> **Hypothesis 1b:** *Students in all three groups will report improvement in their writing skills.*

Research Question 2: Will students who participate in online peer feedback exhibit a stronger belief that LAN sessions make writing more enjoyable than students who participate in face-to-face feedback?

> **Hypothesis 2:** *Both the online feedback and face-to-face feedback groups will agree with the statement "LAN sessions make writing more enjoyable."*

Research Question 3: Will students who participate in peer feedback report that feedback is worthwhile?

> **Hypothesis 3:** *The mean score for worth will be higher than the midpoint.*

Data Collection

Before the advent of the peer feedback system, students were required to write three 8- to 10-page papers. With the start of the peer feedback system, students are required to write five short essays online in addition to the three 8- to 10-page papers. Since the students are writing more now than was required of them in previous years, analysis of grade data collected over a period of years will not distinguish whether peer feedback, the increased amount of writing, or the interaction of the two is responsible for any improvement in the grades. As a result, this research is based on self-reported perceptual data.

Classes were chosen for participation based on the type of feedback they received. Students were randomly assigned to instructors at the beginning of the academic year and each instructor chose his method of implementing peer feedback.

Questionnaire. Students involved in the study were asked to respond to a questionnaire which explored their experiences, both with peer feedback and with writing in general. For purposes of this study, there were two different questionnaires, one for students who were members of the online feedback and face-to-face feedback groups, and one for students who were members of the no feedback group.

Students in the online and face-to-face feedback groups answered the questionnaire containing eleven questions contained in appendix A. This questionnaire was divided into four sections. The first section consisted of two open-ended questions that dealt with the type of feedback students receive or expect to receive from their peer feedback partners.

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Liftig (1990) examined his students comments about the feedback they received and discovered that his students preferred specific feedback over vague feedback. Mangelsdorf (1992) also explored the types of feedback received by her students. She solicited responses from her students and placed the responses to these questions into one of three categories; positive, negative, or mixed (positive and negative). She found that a majority of her students reported positive comments. Questions in section one of the questionnaire were taken directly from the study conducted by Mangelsdorf (1992).

The second section of the questionnaire consisted of four questions that dealt with the students' opinions concerning the worth of feedback. The literature showed that successful peer feedback resulted in improved writing skills. This improvement came from a two-stage process. In the first stage the student accepted the feedback. For this to happen, the student had to believe that peer feedback is useful and valuable (George, 1985; Mangelsdorf, 1992). If the student accepted the feedback in stage one, progression to stage two occurred: incorporation of the suggestions into his writing. This inclusion of the ideas resulted in improved writing skills. The measure of the students' attitude about these two intermediate steps and their attitude about peer feedback improving their writing skills were indications of whether or not the student thinks that the feedback experience is worthwhile. The items on the questionnaire that addressed usefulness and value were also taken directly from Mangelsdorf's (1992) study.

The Air Force Academy is a competitive environment. The ultimate indication of the student's place in this competition is the grades received. English Department faculty members indicate that most students' primary concern is their grades. This concern leads to student inquiry as to what can be done to improve their grades. Because of the

importance that the students place on their grades, it is thought that the belief that peer feedback will result in a better grade will be an indication of the student's belief that feedback is worthwhile.

As outlined by the above paragraphs, the concept of worth is indicated by student beliefs about whether the feedback: is useful, is valuable, is likely to make their writing improve, and is likely to help them make a better grade. Questions 3 through 6 on the questionnaire address the different dimensions of worth. Students were asked to rate their degree of agreement to the statements on the five-point likert scale found Figure 2.

Figure 2. Five Point Likert Scale

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

These four items combined to determine a score for "worth" and are listed below:

Q3. "I find it useful to have my classmates read my papers and give me feedback."

Q4. "My writing is likely to improve because of peer feedback."

Q5. "The feedback my classmates provide is valuable to me."

Q6. "Receiving peer feedback helped me make a better grade."

To assess whether grouping these items represents a reliable means for measuring the construct of worth, a reliability analysis was conducted to measure internal consistency. The internal consistency measure for items 3 through 6 yielded a Cronbach's alpha of .86. This suggests that all four questions relate to each other strongly and therefore are all indicators of the concept of worth.

The third section asked the students to report change, or improvement in their writing skills over the course of the semester. This was accomplished by asking two questions. Question seven asked the students to rate, on the scale in Figure 3, their writing skills at the beginning of the semester. Question eight asked the students to rate, on the same scale, their writing skill when the questionnaire was administered.

Figure 3. Ten Point Likert Scale

1	2	3	4	5	6	7	8	9	10
poor				average					excellent

The fourth section dealt with the students' opinion of whether or not LAN sessions make writing more enjoyable. This section was added at the request of the sponsor.

Students who received no feedback answered the four questions which composed part three of the questionnaire described previously. These four questions were renumbered when administered to this group. Appendix B contains the questionnaire administered to the students in the no feedback group.

Questionnaires were administered to and completed by the students during part *B* of the fifth and final LAN session of the semester. This LAN session was scheduled approximately two weeks before the end of the semester.

Questionnaires were disseminated in two different ways. The online feedback group received online questionnaires and were instructed to answer these questionnaires in the same manner they accomplish feedback. They were to respond to the questions online to post the completed questionnaire to the common drive. The instructors of this

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group then copied all the questionnaires to a disk. Students in the face-to-face and no

feedback groups filled out a paper copy of the questionnaire during class time.

Data Analysis

The responses to the questions on the questionnaire are divided into four smaller

sets. The data sets the questions belong to, the concept they measure, the research

question they relate to, and the feedback groups which were canvassed for information

are shown in Table 1. The method used in analyzing these data sets is outlined below.

Table 1. Research Questions as They Relate to Data Sets

Research Question	Data Set	Concept Measured	Questions	Online Feedback	Face to Face Feedback	No Feedback
1	One	mprovemen	7,8	yes	yes	yes
2	Two	Enjoyment	11	yes	yes	no
3	Three	Worth	3,4,5,6	yes	yes	no
n/a	Four	Types of Feedback	1,2	yes	yes	no

Data Set One. Questions seven and eight ask the students to rate, on the scale in

Figure 3, their writing skills at the beginning and end of the semester, respectively. The

data was then separated by treatment group and a paired sample T-test was accomplished

to determine if there if there was a significant difference between the before and after

scores.

An improvement score was derived from the data by subtracting the score for

question seven from the score for question eight. The data was then examined for

anomalous responses. Once anomalous data was removed, the means of the improvement

scores were compared using a one-way ANOVA.

Data Set Two. Question 11 was scored on the scale in Figure 2. The results were then divided into two groups, online feedback and face-to-face feedback. Finally, the data was analyzed using visual comparison of the means and an independent samples T-test.

Data Set Three. The questions used to determine worth were answered using the scale Figure 2. Once the responses were collected they were separated into two groups, online feedback and face-to-face feedback. The means of each group were compared for each item in the set to determine if they were above the midpoint. A comparison of means between the groups was then accomplished using a one-way ANOVA to determine if there was a significant difference between the means for any individual question. The scores were then aggregated and an overall mean score for worth was determined for both the online and face-to-face groups. A comparison of these means was then accomplished using an independent samples t-test.

Data Set Four. The two questions that comprise data set four were open-ended questions that were not conducive to empirical analysis. With the consensus of another researcher, a list of responses was created, then these responses were assigned to three broad categories; content, flow, and grammar. The responses were divided into online feedback and face-to-face feedback. The percentage of responses for each question that fell into each category were compared in total and between groups to see if there was any difference between the responses for the two questions.

Summary

This chapter has outlined the information necessary for the completion of this study. Once the necessary background information was explained, research questions to be answered were identified, methods used for data collection were described, and the methods that will be used to analyze the data once it was collected were profiled. Now that an understanding of the methodology for data collection exists, Chapter IV presents the results of that analysis.

IV. Findings and Analysis

Overview

This chapter shows the results and analysis of the data collected. First, the data used to test each hypothesis is presented. Then, the data collected to support the discussion on types of feedback received and expected is analyzed.

Results

Data from one instructor was eliminated for two reasons; first, the students in the class were not all randomly assigned to that class (the class contained a high number of remedial students), and second, the instructor practiced a combination of face-to-face and online peer feedback. This mixture of feedback methods precludes their membership in any one of the three groups tested.

Scores for writing skill from two individual students (one in the online feedback group and one in the no feedback group) resulted in negative improvement scores. A negative improvement score was considered invalid. Since these scores were derived from self reported perceptual data, there is a possibility that a negative improvement score could be the result of some factor other than deterioration in writing skills.

Research Question 1. Research Question 1 asks if students who received peer feedback, either online or face-to-face, will report more improvement in writing skills than students who did not participate in feedback. The two hypotheses used to test this question and the results of the data analysis are below.

Hypothesis 1a: Students in all three groups will report a significant change in their writing skills between the beginning of the semester and the end of the semester.

As expected, all three groups (online, face-to-face, none) report significant difference (p<=.001) in their writing skills from the beginning of the semester to the end of the semester as shown in Table 2.

Table 2. Comparison of Means for Improvement Scores: Within Group

Group	N		mean writing score	t	P
Online	46	before	5.8200	10.563	p<=.001
		after	7.4200		
Face to Face	50	before	5.6061	7.160	p<=.001
		after	6.9091		
None	33	before	5.3696	12.000	p<=.001
		after	7.3696		

Hypothesis 1b: Students in all three groups will report improvement in their writing skills

All three groups report a positive improvement score, indicating that they perceive improvement in their writing skills. These scores are shown in Table 3.

Table 3. Comparison of Means for Improvement: Between Groups

Group (Mean Improvement)	Online	Face to Face
Online (2.000)		
Face to Face (1.608)	F=2.030 p=.085	
None (1.364)	F=.617 p=.688	F = 1.323 p=.284

There is no significant difference between the improvement scores of the three groups at the p=.05 level, also shown in Table 3, suggesting that while the members of all three treatment groups reported significant improvement in their writing skills from the

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beginning of the semester to the end of the semester, no group reported significantly more improvement than any other.

Research Question 2. Research Question 2 asks if students who participate in online peer feedback will exhibit a stronger belief that LAN sessions make writing more enjoyable than students who participate in face-to-face feedback. The hypothesis tested for this research question and the results of the data analysis are below.

Hypothesis 2: Both the online feedback and face-to-face feedback groups will agree with the statement "LAN sessions make writing more enjoyable."

The means shown in Table 4 suggest agreement with the statement on the part of the students who receive peer feedback online, and possible neutral feelings with the statement on the part of the students who receive feedback face-to-face. Because the mean of the face-to-face group is close to the midpoint of the scale, this score may indicate neutrality to the statement rather than disagreement. Because the mean of the online group is close to the score for agree on the scale, this score may indicate agreement with the statement.

Table 4. Comparison of Means for Enjoyment

Group	Mean	t	p
Online	3.717	3.851	p<=.001
Face to Face	2.932		

Also as shown in Table 4, the online and face-to-face feedback groups showed a significant difference in the mean answer to this question, suggesting that the online group members agreed more strongly with the statement than the face-to-face group members.

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Research Question 3. Research Question 3 asks if students who participate in peer feedback report that feedback is worthwhile. As outlined in Chapter III, questions 3 through 6 address the four dimensions of worth: students' beliefs about whether the feedback is useful, is valuable, is likely to make their writing improve and, is likely to help them make a better grade.

Hypothesis 3: The mean score for worth will be higher than the midpoint.

The mean scores for worth for each type of feedback are in Table 5. Both means are above the midpoint of three, suggestion that both groups believe that feedback is worthwhile. An independent samples t-test shows that the difference between the means for the online and face-to-face groups is significantly different at the p=.02 level. This suggests that the face-to-face feedback group believes that feedback is more worthwhile than the online feedback group.

Table 5. Comparison of Means for Worth

	Mean	t	p
Online	3.78	-2.401	p=.017
Face to Face	3.96		

The means for each question by type of feedback are in Table 6. All of the means are above the midpoint of three, suggesting that both groups agree with all four statements. This would also suggest that both groups find feedback to be worthwhile. An independent samples t-test was conducted to determine if the groups reported significantly different levels of agreement for any of the individual question. At p=.05 level of significance, the online and face-to-face feedback groups had only a significantly different mean for question 6: "Receiving Peer feedback helped me make a better grade,"

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suggesting that while both the online and face-to-face feedback groups agree that feedback helped them make a better grade, the face-to-face feedback group agreed more strongly.

Table 6. Comparison of Means for Questions that Measure Worth

Question	Online Mean	Face to Face Mean	t	p
3	4.022	4.157	-0.964	0.338
4	3.878	3.941	-0.384	0.702
5	3.889	4.020	-1.014	0.313
6	3.300	3.725	-2.594	0.011

Types of Feedback Received. The original intent of collecting the data in data set four was to explore the types of feedback the students received and the types of feedback the students found most helpful from the point of view of the two scales found in the literature: positive/negative (Mangelsdorf, 1992) and vague/specific (Liftig, 1990). The data collected proved to be incompatible with categorization into these categories. Several different researchers voiced the belief that peer feedback is intended to improve writing, not by focusing on mechanics and flow, but by focusing on content (Sultan, 1988; Liftig, 1990; MacArthur, 1994). It was also reported that students find feedback that addresses content more helpful than feedback that addresses mechanics or flow (Newkirk, 1984). It is expected that both feedback groups will report that the majority of the comments they received will be related to content. It is also expected that both groups will report a preference for feedback related to content. The data collected for the first two questions were placed in the broad categories content, flow, and mechanics. Comments were scored in the "content" category if they mentioned feedback that

improved the content, pointed out the point of view of the paper, or gave ideas for increasing the depth of the analysis of the reading. Comments were scored in the "flow" category if they mentioned feedback that helped improve transitions, clarify thesis statements, and organize thoughts better. Comments were scored in the "mechanics" category if they mentioned feedback that focused on punctuation, spelling and grammar. There is one caveat: scoring the data this way was somewhat subjective. Since the questions were open-ended, no two responses were alike, and while several concepts were repeated, it was up to the researcher to determine which category a response belonged in. Because of this, conclusions as to the content of the feedback should be made with caution. Results of the types of feedback received and wanted yielded the percentages listed in Table 7.

Table 7. Types of Feedback

Group	Type of Feedback Received				Type of Feedback Wanted			
	N	Content	Flow	Mechanics	N	Content	Flow	Mechanics
Online	97	51%	33%	16%	62	56%	29%	15%
Face to Face	84	21%	43%	36%	57	32%	46%	23%
Total	181	37%	38%	25%	119	45%	37%	18%

The online group reports that the majority of the comments received address content. The majority of comments this group would like to receive also address content. The face-to-face group reports that the majority of the comments received address flow. The majority of comments this group would like to receive also address flow.

Summary

Students who received peer feedback did not report more improvement in writing skills than students who did not receive peer feedback. All students who participated in

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feedback felt that feedback was worthwhile; however, students who participated in face-to-face feedback reported a significantly higher score for worth. Students who participated in online peer feedback believed that LAN sessions made writing more enjoyable, while students who participated in face-to-face feedback did not report agreement with this belief. The analysis shows support for the hypotheses used to answer these research questions, as shown in Table 8.

Table 8. Results Summary

	Research Questions/Hypotheses	Supported?
RQ1	Will Students who received peer feedback, either online or face to face, report more improvement in writing skills than students who did not participate in feedback?	
H1a	Students in all three groups will report a significant change in their writing skills between the beginning of the semester and the end of the semester	Yes
H1b	Students in all three groups will report improvement in their writing skills	Yes
RQ2	Will students who participate in online peer feedback exhibit a stronger belief that LAN sessions make writing more enjoyable than students who participate in face to face feedback?	
H2	Both the online feedback and face to face feedback groups will agree with the statement "LAN sessions make writing more enjoyable."	No
RQ3	Will students who participate in peer feedback report that feedback is worthwhile?	
H3	The mean aggregate score for the items that measure the concept of worth will be higher than the midpoint	Yes

V. Discussion

Chapter Overview

This chapter offers a look at the significance of the results found in Chapter IV in the context of the Air Force Academy English Department. These results are discussed as they reply to the hypotheses. Limitations of this study are then discussed, and finally, suggestions for further research are provided.

Discussion of Results

In this section, the results of the research as they apply to each research question are discussed. Next is some discussion as to the impact these results may have on the LAN Online Peer Feedback program.

Research Question 1. It was not surprising to see that the students reported a significant improvement in their writing skills from the beginning of the semester to the end. It would have been unusual for them to report no improvement or negative improvement. The class they are enrolled in is designed to improve their writing; therefore, it was expected that all three groups would report a significant improvement in their writing skills. This is a positive sign for the English program as a whole. It suggests that the course is serving its intended purpose, improving the writing skills of the students.

The real interest lay in determining if the groups who received online and face-to-face feedback reported significantly more improvement than the group that received no feedback. It was expected, based on the literature, that the students who received

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feedback would report more improvement than the students who received no feedback. Surprisingly, this was not the case.

While the overall mean improvement for the no feedback group *was* lower than the mean improvement for the other groups, the difference was not statistically significant. This would suggest that feedback does not have an overall impact on the perceptions the students have about improvement in their writing skills. Taken by themselves, these results could be an argument for the end of the peer feedback program. However, while the mean improvement for the no feedback group was not significantly different from the mean of the other groups, it was the lowest improvement score. It is possible that with further study, the difference could prove to be significant. Therefore, an argument for the termination of the peer feedback program should not be made based on this data.

Research Question 2. It was also expected that all students who participate in peer feedback would report that writing was more enjoyable when the LAN was used. The online feedback group did report a significantly higher agreement score than the face-to-face feedback group. Surprisingly, the overall mean score for enjoyment from the face-to-face feedback group was 2.932, slightly below the midpoint of the scale. This would denote an attitude that is leaning toward disagreement with the statement. This score is close enough to the neutral score to be considered neutral, but is not the attitude that was expected. The online feedback group's mean score is on the "agree" side of neutral. This suggests that participating in both writing and feedback using the computer positively affects the students' enjoyment of the writing process.

Research Question 3. In light of the reported improvement in writing skill, and the agreement that LAN sessions made writing enjoyable by the online peer feedback group, it was not surprising that students who participated in online peer feedback found it to be worthwhile. It was surprising, however, to find that the students who participated in face-to-face feedback, even though they did not agree that LAN sessions made writing more enjoyable, not only found peer feedback to be worthwhile, but reported a stronger belief that it was worthwhile than the online feedback group. This suggests that students need not find writing enjoyable to appreciate a tool that helps them improve their writing.

Types of Feedback Received. According to the literature, students prefer feedback about the content of their writing as opposed to feedback that simply helps with the flow or corrects mechanical errors. The responses to the questions about type of feedback received and type of suggestions that would be helpful showed some surprising results, suggesting that the two feedback groups receive and want different types of feedback. In line with the literature, the majority of the online feedback group receives and wants feedback on the content of their writing. This was not the response from the face-to-face feedback group. The face-to-face feedback group reported data that suggests they receive and want feedback relating to the flow of their writing. The unexpected aspect of this result is that the two groups reported a desire for different types of feedback. This result bears further consideration.

Summary of Results. The overall conclusion gleaned from this data is that, even though there was no significant difference in reported improvement in writing skills, the peer feedback system is serving a useful purpose. One of the groups that participated in

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peer feedback reported that it made writing more enjoyable and both groups that participated in peer feedback believed that it was worthwhile. Given the findings, one possible suggestion would be to expand participation in peer feedback so that every student has the opportunity to use this worthwhile tool. The reports as to type of feedback received and wanted suggest that the two feedback groups have different ideas about the purpose of feedback. It may be beneficial to conduct a review of the feedback training process and the feedback implementation process to determine where this difference in ideas comes from. Research would suggest that the purpose should be to improve the content of the students' writing. The students should be given an understanding of the purpose of the feedback.

Limitations

Several limitations in this study made data comparison difficult. One of the limitations stems from the fact that the terms and conditions used for the peer feedback program were defined before the research was proposed. These terms were not defined for the study specifically. Because of this, there was a lack of data concerning writing enjoyment and the LAN sessions for the students who did not receive feedback. Originally, the terms online feedback and LAN session were used interchangeably. After careful observation, the conclusion was reached that the term "LAN session" referred to the use of the computer in general and was not associated with the kind of feedback received. As a result, all students enrolled in English 111 should have been considered participants in LAN sessions. All students participate in LAN sessions, but not all students participate in feedback. As a result, question 11, "LAN sessions make writing

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more enjoyable," did not just apply to the students who receive peer feedback. It would have been valuable to include data for the students who receive no peer feedback in the analysis of this question.

The second limitation of this study was the reliance on perceptual data. While it is possible to determine improvement based on student perception, it would be more valuable to determine any improvement based on long term empirical data like grades.

The third limitation of this study was the relatively small number of subjects in each group. While the groups were all above the minimum number (30) needed to assume a normal population, the small number limits the study's ability to be reproduced in larger population pools. Future study using a larger sample size should be accomplished in order to verify the results found in this study.

The final limitation of this study is the fact that the study itself is retrospective. This is a problem for two reasons. First, the way the data was collected forced the subjects to evaluate performance in the past and performance in the present at the same point in time. This may have affected the perceived improvement. Secondly, the study is a retrospective report on situations as they already existed. This eliminates any ability to control the variables. In the future, it would be more valuable to control for all independent variables. This will allow the differences discovered to be attributed to the dependent variable being studied (i.e. kind of feedback). These controls include ensuring that initial feedback instruction is completed the same way for each group, and ensuring that partner assignment is accomplished the same way for each group.

Recommendations for Future Research

As stated above, it would be valuable to include the students who receive no peer feedback in the analysis of the data for the writing enjoyment. This would give some indication of whether the reported agreement that LAN sessions make writing more enjoyable could be attributed to participation in LAN sessions as a whole, or participation in peer feedback specifically.

Further study needs to be accomplished to determine what differences are caused by the different types of feedback. More specifically, while the improvement reported was not significantly different for the three groups, the no feedback group had a mean that was lower than the other two groups. It would be interesting to see if the reported improvements would be significantly different if the sample group contained more members, or the peer feedback system had been in for a longer time. It would also be interesting to follow a set of students for a period of years to see of long term participation in peer feedback has more of an impact on writing ability than no participation in peer feedback.

Future research should also be accomplished to address the reported differences between the online group and the face-to-face group in feedback received and wanted. Inquiry into the validity of this difference, as well as the reason for it, if it is valid, should be accomplished.

Future research should address the limitations of the questionnaire. Despite the reasonably high Cronbach's alpha reported for the items that measure worth, the questionnaire was a preliminary attempt to measure the opinions of feedback. Future

studies should begin with a more complete assessment of the validity of the questionnaire, and progress to refinement and testing of the questionnaire

Finally, future research should focus on studies that overcome the limitations mentioned above. There was a lack of empirical studies in the literature. Future research that identifies and controls for the variables in feedback instruction and implementation would be a valuable addition to the body of research.

Thesis Summary

The results of this research effort provide a positive statement about the Air Force Academy English Department and their online peer feedback program. Students report improvement in their writing skills and believe that peer feedback is worthwhile. This suggests that the online peer feedback program is effective in the eyes of the students. Also, students who receive online peer feedback report that LAN sessions make writing more enjoyable. This provides a positive argument for the use and spread of the peer feedback program. While this study raises more questions than it answers, it provides a good foundation for further research focused on the identification and resolution of questions about peer feedback.

Think about the peer feedback you received from LAN session 5 and answer the questions below.

1. What kinds of suggestions do you receive from your classmates? Please give examples.

2. What kinds of suggestions are most helpful to you? Please give examples.

Please pick a number from the scale to show how much you agree or disagree with each statement and circle/mark the appropriate number.

3. I find it useful to have my classmates read my papers and give me feedback

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. My writing is likely to improve because of peer feedback

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. The feedback my classmates provide is valuable to me

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. Receiving peer feedback helped me make a better grade

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. From the scale below, please choose the number that best describes how you would rate **your** writing skills at the **beginning of the semester.**

1	2	3	4	5	6	7	8	9	10
poor				average					excellent

8. From the scale below, please choose the number that best describes how you would rate **your** writing skills **today.**

1	2	3	4	5	6	7	8	9	10
poor				average					excellent

9. From the scale below, please choose the number that best describes how you would rate the writing skills of the **entire class** at the **beginning of this semester.**

1	2	3	4	5	6	7	8	9	10
poor				average					excellent

10. From the scale below, please choose the number that best describes how you would rate the writing skills of the **entire class** as of **today.**

1	2	3	4	5	6	7	8	9	10
poor				average					excellent

Please pick a number from the scale to show how much you agree or disagree with each statement and circle/mark the appropriate number.

11. LAN sessions make writing more enjoyable.

1	2	3	4	5
Strongly	Disagree	Neutral	Agree	Strongly
Disagree				Agree

1. From the scale below, please choose the number that best describes how you would rate **your** writing skills at the **beginning of the semester.**

   1   2   3   4   5   6   7   8   9   10
poor   average   excellent

2. From the scale below, please choose the number that best describes how you would rate **your** writing skills **today.**

   1   2   3   4   5   6   7   8   9   10
poor   average   excellent

3. From the scale below, please choose the number that best describes how you would rate the writing skills of the **entire class** at the **beginning of this semester.**

   1   2   3   4   5   6   7   8   9   10
poor   average   excellent

4. From the scale below, please choose the number that best describes how you would rate the writing skills of the **entire class** as of **today.**

   1   2   3   4   5   6   7   8   9   10
poor   average   excellent

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Vita

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13. ABSTRACT (Maximum 200 Words)

This thesis explores the effectiveness of the Air Force Academy's Department of English local area network peer feedback system. Four main questions were examined. These questions explored a) whether students reported improvement in their writing, b) whether students reported that feedback is worthwhile, c) whether students reported that LAN sessions increase enjoyment of writing, and d) what types of feedback the students 1) received and 2) found most helpful.

Three groups were studied. Forty-six students received feedback online, fifty students received feedback face-to-face, and thirty-three students did not receive feedback. Comparisons were made for the questions mentioned above to see if there was any difference in the responses based on the method of feedback the students received.

The results of the study suggest that students' perceived writing improvement is not affected by the peer feedback program. Peer feedback is successful in that students who participate find it to be worthwhile and at least one group believes that it makes writing more enjoyable. Finally, the two feedback groups reported receiving and wanting different types of feedback. The online group receives and prefers feedback on content, and the face-to-face group receives and prefers feedback on flow.

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3. **Please estimate** what this research would have cost in terms of manpower and dollars if it had been accomplished under contract or if it had been done in-house.

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4. Whether or not you were able to establish an equivalent value for this research (in Question 3), what is your estimate of its significance?

a. Highly   b. Significant   c. Slightly   d. Of No
   Significant   Significant   Significance

5. Comments (Please feel free to use a separate sheet for more detailed answers and include it with this form):

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